



**Testimony before the United States Senate Committee on Health, Education,  
Labor and Pensions  
William W. Eaton, PhD.  
January 20, 2016**

This testimony is designed to give a brief and selective review of important aspects of public health as applied to the mental and substance use disorders. The presenter is William W. Eaton, professor and former chair of the Department of Mental Health, Bloomberg School of Public Health, Johns Hopkins University. The testimony represents the opinions of William Eaton and not the viewpoint of the Johns Hopkins University.

It is an opportune time for the United States Senate to be conducting hearings about mental and substance use because of the growing awareness of the importance of this topic. This growing awareness is in part due to the creation, about 20 years ago, of an algebra for estimating the overall burden of diseases, which allows comparison of the burden of diseases such as cancer, which are often fatal, to diseases such as depressive disorder, which is impairing and often long-lasting, but not as likely to be fatal <sup>1, 2</sup>.

The new metric—Disability Adjusted Life Years, or DALYs—is accepted around the globe. Combining epidemiologic data on incidence, chronicity, and associated mortality for a given disorder, with clinical information about the disability associated with a disorder, it is possible to estimate the number of Disability Adjusted Life Years experienced by the total world population in a year—that is, entire burden of all occurrences of the specific disorder in the world, with this metric. As well, the total number of DALYs experienced as a result of all diseases in the world can be estimated.

The broad category of mental and substance use disorders were responsible for 7.4% of the total disease burden experienced in the world in 2010—about the same percentage as the category of malignant neoplasms, and less than the 11.9% explained by the category of cardiovascular and circulatory diseases <sup>2</sup>.

In the United States and Canada in 2004, where the effect of fatal diseases of infancy and childhood is lessened than in the world as whole, the mental and substance use disorders were by far the largest contributor to the total burden of disease (about 24% of the total number of DALYs), compared to any other categories, such as cancer (12% of total DALYs) or cardiovascular conditions (14%) <sup>3</sup>.

For more narrow disease conditions, Unipolar depressive disorders were responsible for 8.4% of the DALYS in the United States and Canada, the largest source compared to all other diseases (e.g., ischemic heart disease, responsible for 6.3%; cerebrovascular disease accounting for 3.9%). The fifth most important cause in the United States and Canada was alcohol use disorders (3.4% of all DALYs).

The importance of mental and substance use disorders has been emphasized for many years in prior reports such as the Surgeon General's Report in 1999<sup>4</sup>, the President's New Freedom Commission in 2003 <sup>5</sup>, and the Institute of Medicine report in 2006 on Improving the Quality of Health Care for Mental and Substance-Use Conditions<sup>6</sup>. Since the development of the Burden

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of Disease metric, the importance of mental and substance use disorders has been more firmly established.

The estimates of DALYs for mental and substance use disorders are higher than for other sometimes fatal disorders such as cancer because of the lifetime structure of these disorders: the mental and substance use disorders start much earlier in life, during childhood and adolescence in many cases, and a sizable proportion of the mental and substance use disorders endure for many years <sup>7</sup>.

But the estimate may actually be biased low, because of the effect the mental and substance use disorders have in raising risk for important medical conditions such as diabetes, heart disease, stroke, and dementia. For example, a person with a history of depressive disorder has about two or three times the risk for onset of diabetes, or having a heart attack or stroke, as someone who has not had an episode of depressive disorder. This enhanced risk associated with depressive disorder is larger than many other well-known risk factors, such as a family history of the physical condition, or, for heart attack as an example the raised risk associated with high blood pressure or high cholesterol. For each of these medical conditions this enhanced risk resulting from depressive disorder has been <sup>28</sup> replicated in more than five studies <sup>8-10</sup>.

There is also enhanced risk for onset of dementia in those with a history of depressive disorder, replicated more than five times.<sup>11</sup> It has been estimated that persons with severe mental illness like schizophrenia and bipolar disorder have 20 years shorter life span<sup>12</sup> than the general population, probably not caused by their mental illness, but rather because the treatment and prevention of other chronic medical conditions is ignored.

There are three important implications of these findings of mental to physical comorbidity.

- First, the estimates of disease burden for mental and substance use disorders may be biased low because they don't account for mental disorders as early sources of physical disorders.
- Second, the possibility exists to lower the risk for the physical disorders by successful treatment of the mental disorders. Less than half of those with mental and substance use disorders get into treatment, in part due to the stigma of mental and substance use disorders, in part due to the cost involved, and in part due to the difficulty in finding good options for treatment<sup>13</sup>. This logic reflects on the advantages of improving the system of care for mental and substance use disorders.
- Third, the health care system will benefit by integrating systems of primary health care with systems designed for treatment of mental and substance use disorders. An aspect of mental and substance use disorders that is not well-appreciated is that there are many viable techniques for preventing their occurrence. The high prevalence of these disorders, their comorbidity, and the difficulty of treating them successfully argues for population-based prevention programs, which typically are aimed at entire populations ("universal interventions") or populations thought to be at high risk for the disorders ("selective interventions"). Because the disorders start early in life, it is logical to take advantage of prevention programs oriented toward childhood, adolescence and young adulthood. These prevention programs typically involve social activities of some sort, as opposed to medical interventions that occur after onset of disorder. For example:

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- The Nurse-Family Partnership Program begins by identifying high-risk births and providing assistance to the mothers in the period after birth <sup>14</sup>.
- The Good Behavior Game activates a social awareness in first graders with strong beneficial effects which last into adulthood <sup>15</sup>
- The Teenscreen program facilitates schools to identify and get help for adolescents who may be at risk for suicide <sup>16-18</sup>
- The Adolescent Depression Awareness Program<sup>19, 20</sup> which is information about depressive disorder, designed in a format similar to information about other medical illnesses already available in the Health curriculum of many High Schools.

These are examples of successful programs which have been widely adopted, but their application could be expanded, and the results would be a diminution of the later occurrence of mental and substance use disorders. In 1994 the report of the Institute of Medicine Committee on Prevention of Mental Disorders concluded that: "There could be no wiser investment in our country than a commitment to foster the prevention of mental disorders and the promotion of mental health through rigorous research with the highest of methodological standards."<sup>21</sup> This statement is still true.

There have been many advances in understanding the genetics of mental and substance use disorders in the last few decades, including breakthrough statistical techniques involving large samples of subjects (so-called Genome-Wide Association, or GWA, studies)<sup>22</sup>. Although most mental and substance use disorders have a moderate or strong tendency to be inherited, it is increasingly apparent <sup>29</sup> that the inheritance will almost always be very complicated, involving many genes interacting in myriad ways. In the last decade it has become clear that the DNA can be permanently or temporarily activated, or deactivated, throughout the course of life ("methylation") <sup>23</sup>. The sources of the methylation include exposure to toxins, obstetric events, physical illnesses, and the vagaries of social life.

Therefore, it seems likely that the next decade will involve increasing research on the way in which genetic background and the biological and social environment interact to change the future risk for mental disorder. In turn, these developments are likely to inform the design of selective intervention programs.

The most glaring problem of this nation with regard to mental and substance use disorders is the failure to help people with disorders of psychotic intensity (schizophrenia and bipolar disorder), even though the deinstitutionalization movement in the early 1960's was supposed to free them from the asylums which had been designed originally to protect them. People do not choose to have schizophrenia, and it places an enormous and unfair burden on them. Since schizophrenia persists in the population, generation after generation, even though people with schizophrenia have low fertility, it may be that they are carrying the genetic burden for the rest of us—that is, the large number of genes connected to schizophrenia are healthy and life-preserving for most of the population, producing schizophrenia only when the genes combine, rarely, in a very particular fashion (an extension of the theory of heterozygote advantage<sup>24</sup>, <sup>25</sup>[ENREF\\_24](#)). So, we owe them!

Contrary to some characterizations, schizophrenia is not progressive in its nature: rather, people adapt to the disease over the life course, just as they might adapt to having diabetes.<sup>26</sup> The social environment in which they live is strongly associated with their success in adaptation. The

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social environment should be free from stigma, stable, with uncomplicated access to medical care, a structured workday, and the presence of friends and acquaintances. This structure is the aim of many rehabilitation programs, including the well-known clubhouse model, which has shown good success in generating stable employment and lower health costs. <sup>27-31</sup>[\\_ENREF\\_25](#)

The organization of government efforts to reduce the burden of mental disorders has become increasingly complex over the last several decades. In the early 1970's the National Institute of Mental Health (NIMH), part of the National Institutes of Health, was split into three institutes, including the NIMH, the National Institute on Alcohol Abuse and Alcoholism (NIAAA), and the National Institute on Drug Abuse (NIDA). The Substance Abuse and Mental Health Services Administration (SAMHSA) was created in the early 1990's. Many of the programs of these four units of the government overlap. For example, there are many separate surveys that estimate the use of marijuana or alcohol use in young people, some on a yearly basis (Monitoring the Future, funded by the NIDA<sup>32</sup>); National Survey of Drug Use and Health (funded by the SAMHSA)<sup>33</sup>, the National Epidemiologic Survey of Alcohol and Related Conditions (funded by the NIAAA)<sup>33</sup> and National Comorbidity Survey and its replication<sup>34, 35</sup> (NCS and NCS-R, funded by the NIMH).

There are programs on prevention of suicide in the NIMH and the SAMHSA, and programs of research on prevention of mental and substance use disorders in all four units. One logical consolidation is to combine the two units focused on substance use, NIAAA and NIDA, into one National Institute on Substance Abuse ("NISA"). There is extensive comorbidity between drug and alcohol use disorders<sup>36</sup>, and many of the basic mechanisms of addiction are shared by the two groups of disorders, so consolidation would likely strengthen research efforts on both these closely-related groups of disorders.

Since the formation of the SAMHSA, the public health aspects of the NIH units, especially that of the NIMH, have been diminished considerably. Even though the preventive interventions described above have a social aspect, the focus of research has been increasingly on the brain, missing the opportunity to design and implement effective new population-based interventions. Another departure from public health at the NIMH is the new disregard for diagnostic categories as a focus of research interest <sup>37</sup>, thereby emasculating the field of psychiatric epidemiology, the basic science of public mental health, because epidemiology requires an identifiable outcome.

As well, the study of service systems and treatment research is hampered because there is a need for data on diagnoses as outcomes of preventive and clinical trials, and effectiveness of treatment systems as recorded in medical records. <sup>30</sup>

This new focus of the NIMH has puzzled the international community [\\_ENREF\\_24](#) <sup>38</sup>.

Many SAMHSA programs have a public health focus on prevention in the population, and on treatment systems. Some of these programs are excellent, but others lack a research base. There is relatively little focus in SAMHSA programs on disorders of psychotic intensity (described above), which, though rare, are the most impairing and most in need of attention. It may seem strange, but there is only one epidemiologist at the NIMH, and only one psychiatrist at the SAMHSA! It might be useful and efficient to combine some programs of the SAMHSA into the two NIH units (NIMH and the new NISA mentioned above), to reduce duplication, on the one hand, and to ensure that they retain a public health focus, on the other hand. This consolidation

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would generate better ability to take advantage of the new developments in gene by environment interactions described above, because the programs would be more likely to stay abreast of the rapidly developing research advances. It would not be appropriate to simply eliminate the SAMHSA because there are so many programs and services around the United States that depend on SAMHSA for guidance and funding, and there are many productive programs in the SAMHSA.

The consolidation of these programs is a complex task and would require the work of a special commission to design the new units and to schedule the consolidation. The result would be more advances in useful research, more effective treatment systems and prevention programs, and more efficient use of funds.

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